

August 25, 2008

MEMORANDUM

TO: Roger Tinkey, Engineering Manager
Coeur d'Alene Regional Office

FROM: Jennifer Wester, Associate Engineer
Technical Services Division

SUBJECT: Mountain Utility Company at Schweitzer Mountain Wastewater Reuse
Permit Application Review – LA-000090-03 (Municipal Wastewater)

1.0 Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.04 (Wastewater Reclamation and Reuse Regulations) for issuing land application permits. It states the principal facts and significant questions considered in preparing the draft permit conditions or intent to deny, and a summary of the basis for approval or denial with references to applicable requirements and supporting materials. This memorandum supplements those dated May 31, 2002; March 28, 1996; and March 9, 1994; included in Sections 7.1 through 7.3 of the Appendix.

2.0 Project Description

The Mountain Utility Company (hereafter MUC), formerly the Resort Water Company, operates a public drinking water system and a municipal wastewater treatment facility serving the Schweitzer Mountain Resort near Sandpoint, Idaho. The facility currently land applies wastewater on two application sites; the Outback Lodge Wastewater Facility (Outback) located approximately four miles north of the resort, and the Schweitzer Creek (Schweitzer) area located approximately 1½ miles east of the resort. The facility proposes to gradually phase out operation of the Schweitzer site as additional acreage is developed in the drainage of an unnamed tributary to Sand Creek approximately 2 miles east of the resort. For maps of all sites, see Appendix 2 of the attached draft permit.

3.0 Summary of Events

Recreations Utility Company initially received a Wastewater Land Application Program (WLAP) permit on June 18, 1991. Modification of the permit was requested on May 22, 1995 and February 7, 1996. Modification was granted April 11, 1996. With a change in management, Resort Water Company became MUC and was re-permitted on May 31, 2002 (hereafter 'current permit'). MUC submitted an application for re-permitting on

February 27, 2007 (hereafter MUC, 2007b). This application was determined to be complete by DEQ on April 9, 2007.

4.0 Discussion

The following is a discussion of: hydraulic management unit configuration, wastewater storage structures, wastewater flows and constituent loading, ground water, soils, surface water, monitoring requirements, and proposed compliance activities. Conclusions and recommendations are provided in Section 5 below.

4.1 Hydraulic Management Unit Configuration

There will be significant changes at the facility during the upcoming permit cycle with respect to wastewater land treatment acreage. Currently the facility land applies on two sites, Outback and Schweitzer Creek. The Outback site consists of approximately 2.4 acres of drip/subsnow application during both the growing and non-growing seasons. The Schweitzer site consists of approximately 25.5 acres of growing season-only spray irrigation and approximately 34.5 acres of drip/subsnow application during both the growing and non-growing seasons. The facility proposes (MUC, 2007b) to add an additional 85.9 acres of drip/subsnow application during both the growing and non-growing seasons on forested land adjacent to the Schweitzer site in the drainage of an unnamed tributary to Sand Creek (Relocation area). This acreage is proposed to be developed in two phases, beginning during the 2007 construction season with the Schweitzer site being abandoned following completion of the second phase. Section J Standard Condition 10 on page 18 of the attached draft permit requires the facility to “notify DEQ at least six (6) months prior to permanently removing any permitted reuse facility from service.” Sufficient notification has been given by the facility. Section E, condition CA-090-03, as it appears in the attached draft permit, requests the facility to submit for DEQ review and approval, a Site Closure/Rehabilitation Plan for the Schweitzer site which includes; 1) assessment of previous site monitoring data, 2) evaluation of site status, 3) environmental quality goals, 4) plans for abandonment of old lagoons and associated structures, and 5) other management operations necessary for site remediation. For the full text of the condition, see Section E of the attached draft permit.

4.2 Wastewater Storage Structures

The facility has two wastewater storage lagoons at the Schweitzer Creek site. Lagoon #1 was installed in 1970 with a capacity of 1.3 million gallons (MG) and Lagoon #2 was expanded in 1996 to hold 11.7 MG. Under the current permit, the underdrain from Lagoon #2 is monitored twice a year, in June and October, for both flow and fecal coliform. Table 1 shows the results of the underdrain monitoring for 2002 through 2007, as reported in each year’s Annual Site Performance Report.

Table 1 Lagoon #2 Underdrain Flows, 2002 - 2007

Sample Date	Estimated Flow* (gpm)	Fecal Coliform Result (cfu/100 mL)	Total Coliform Result (cfu/100 mL)
7/9/2002	3.0	77	---
10/22/2002	1.5	>2419	---
11/20/2002	---	219	---
6/17/2003	0.33	205	---
10/17/2003	0	17	---
6/22/2004	0.75	80	---
10/19/2004	1.2	500	---
6/15/2005	0.85	23	---
10/15/2005	0.43	500	---
6/28/2006	1.35	ND	---
11/20/2006	0.35	>1600	---
6/12/2007	1.72	---	>1600
10/30/2007	0.19	---	500

* Flows estimated using a bucket and a stopwatch

--- Not sampled at this time

In 2007 (TOEC, 2008), the engineer stated that “elevated levels [of fecal coliform] could be an indication of a lagoon liner problem.” In comparing the available data for the last permit cycle, there is no visible trend in either flow or fecal coliform results that would indicate that the lagoon started leaking during the period of record. Instead, it appears that the lagoon has been leaking for some time. Staff recommends that the monitoring frequency for the Lagoon #2 underdrain be increased for the first year to monthly for the period of March through October and every other month, as accessible, for the other four months of the year.

4.3 Wastewater Flows and Constituent Loading Rates

Trending of wastewater flow rates and rationale for constituent and hydraulic loading rates appearing in the draft permit are discussed below.

4.3.1 Wastewater Flows

No significant changes to the wastewater collection system are proposed for the upcoming permit cycle. Repairs to correct influent and infiltration problems are ongoing. Wastewater generation data supplied with the application materials (MUC, 2007b) set out a projected schedule for wastewater effluent land irrigation areas and lagoon storage for the treatment system. The following table shows the projected growth for the next permit cycle.

Table 2 – Wastewater Treatment System Capacity and Expansion Plan for New Permit Cycle*

System Capacity (ERUs)	Estimated Wastewater Influent (MGA)	Spray Irrigation Area (acres)	Drip Irrigation Area (acres)	Total Irrigation Area (acres)	Lagoon Storage Utilized (MG)	Comments
970	35.7	25.5	36.9	62.4	12.87	Existing system
1420	52.2	25.5	67.9	93.4	12.79	Add 31 acres at new location – Phase IA
1650	60.7	0.0	86.0	86.0	12.58	Abandon Schweitzer, add 55 acres – Phase IB

* Adapted from Table 4 of the application (MUC, 2007)

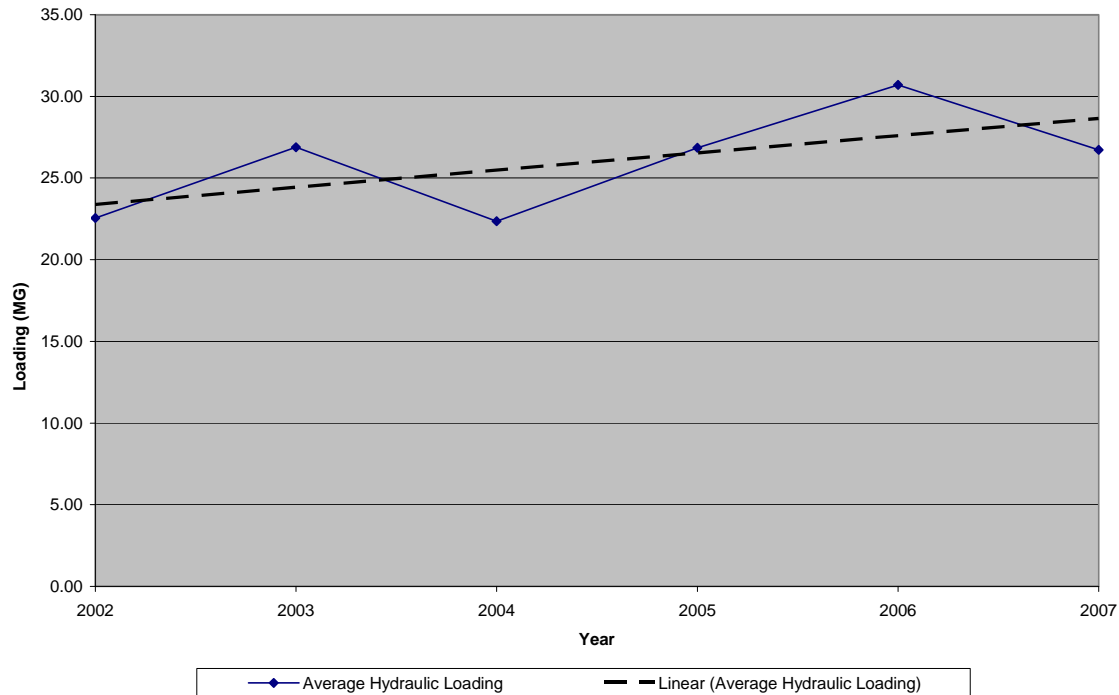
4.3.2 Constituent Loading Rates

The sections below discuss proposed constituent loading rates, including hydraulic, nitrogen, and phosphorus. Changes to the current loading rates for inclusion into the draft permit, Section F, are also discussed.

4.3.2.1 Hydraulic Loading Rates

Wastewater generation data from the operating years of the current permit shows steady growth in annual wastewater generation, from 20.86 million gallons (MG) to 27.79 MG over the period from 2002 to 2006 (TOEC, 2007b). Figure 1 shows the trend in hydraulic loading for the current permit cycle (2002 through 2007). The dashed line is the linear trend of the data and shows that the facility has been experiencing steady growth in their wastewater reuse system. The permitted constituent loading rates determined by DEQ reflect both what is currently practiced and, where appropriate, what is realistically anticipated during the life of the permit.

Figure 1 Average hydraulic loading trend for Schweitzer Mountain



Growing season hydraulic loading should be substantially equal to the irrigation water requirement (IWR) for a forested site. Evapotranspiration (ET) data were taken from the University of Idaho Research and Extension Center at Kimberly, Idaho website (<http://www.kimberly.uidaho.edu/ETIdaho/>) for the Sandpoint KPST station. Areas with significant tree coverage were approximated by “Orchards – Apples and Cherries no ground cover” with “Range Grasses – long season” representing any groundcover present. For the Schweitzer sites, a mixture of 55% orchard and 45% grass was used as an estimate of the forest ecosystem. Using these approximations the facility loadings were calculated to give the growing season values in Table 3 for each month. Since the facility also applies during the non-growing season, additional volume was allowed for subsnow application in order to ensure adequate storage in the lagoons. For a fuller description of the process used to derive the irrigation rates, see Appendix 7.4.

Table 3 Monthly Irrigation Rates for Schweitzer Mountain

Month	Hydraulic Limit ¹	
	Inches/Acre	Gallons/Acre
January	2.76	75,000
February	2.89	79,000
March	2.04	56,000
April	1.24	34,000
May	1.87	51,000

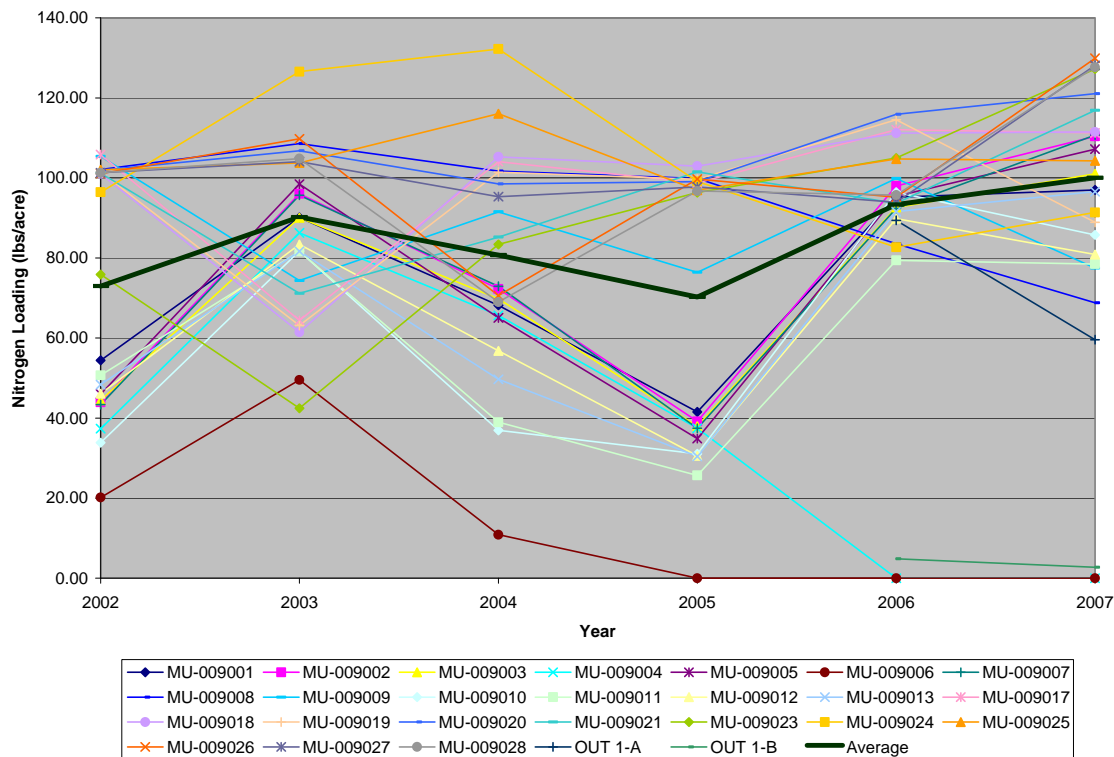
Month	Hydraulic Limit ¹	
	Inches/Acre	Gallons/Acre
June	4.06	110,000
July	5.83	158,000
August	4.40	119,000
September	1.84	50,000
October	1.47	40,000
November	1.11	30,000
December	2.19	59,000

1) Please note that with different application season dates, the Outback area will have a different hydraulic total than the Schweitzer Creek and Relocation areas.

4.3.2.2 Nitrogen Management and Loading Rates

According to the facility's annual reports, the total nitrogen applied to the entire site has ranged from 70.27 lbs/acre in 2005 (BWSD, 2003) to 100.0 lbs/acre in 2007 (BWSD, 2006). As shown in Figure 2, individual HMU loadings have ranged from zero on unused units to 132.24 lbs/acre on MU-009024 in 2004 (TOEC, 2005) and these loading practices do not appear to have been detrimental to the site. The current limit is 150 lbs/acre. The facility has not requested any change to this limit; therefore, staff recommends that the limit continue to be 150 lbs/acre.

Figure 2 Total Nitrogen Loading Trends for Schweitzer Mountain (2002 – 2007, all active HMUs)



4.3.2.3 Phosphorus Loading Rates

The current permit does not include a phosphorus (P) loading limit. Phosphorus loading rates are generally set by DEQ based upon either ground water or surface water concerns. With respect to ground water concerns, DEQ does not usually set a phosphorus loading limit where there is no ground water/surface water interconnection (i.e. where ground water discharging from the down-gradient boundary of the treatment site does not enter surface water). There is one tributary immediately adjacent to the old acreage, Schweitzer Creek, which is monitored both up- and down-stream from the reuse site for nitrate-N, chloride, specific conductivity, as well as total and fecal coliform. Stream sampling results for the last permit cycle show no correlation between the stream concentrations and applied loads for nitrate-N, or either total or fecal coliform bacteria. The new acreage that will be brought online during the next permit cycle has a seasonal tributary that passes through the site before connecting to Sand Creek and ultimately Lake Pend Oreille. No sampling of this tributary has been done. Wastewater is not applied during precipitation events as a means to minimize runoff (and potentially phosphorus-bearing sediment runoff) therefore phosphorus contamination in the nearest surface water (Lake Pend Oreille) should not become a concern during the new permit cycle. A runoff control plan is also included as a compliance activity in Section E, CA-090-01 of the draft permit. As a consequence, staff recommends not adding a loading limit and removing the monitoring requirement for phosphorus in the draft permit.

4.4 Ground Water

Various facility annual reports provide data and discuss ground water quality at the facility. This section discusses ground water impacts from wastewater land treatment, and ground water impacts to wells.

4.4.1 Ground Water Impacts from Wastewater Land Treatment

The facility monitors and maintains thirty-four (34) active groundwater monitoring piezometers at the two active sites, Schweitzer Creek and Outback, and five (5) at the new Relocation site. During construction during the 2007 operation season the piezometers for subsnow application areas S-3 and S-4 were taken offline along with their associated management units. Past data for the Outback site show no significant impacts to groundwater from land application activities. Schweitzer Creek site data show significant total coliform presence in the groundwater samples from approximately ten of the monitoring wells over the period of 2002 through 2007. However, it is not known whether these bacteria are from the wastewater or if they are naturally present in the groundwater. The Ground Water Quality Rule (IDAPA 58.01.11) specifies a primary standard for total coliform of no more than 1 colony forming unit per one hundred milliliters (cfu/100 mL). In the current permit, only downgradient groundwater monitoring is required to comply with the Ground Water Quality Rule. During the next permit cycle, no significant impacts are expected for either the Schweitzer or Relocation areas. This is due to the relatively low strength wastewater applied by the facility that is applied only when all piezometers associated with each individual HMU show groundwater to be more than thirty-six (36) inches below the ground surface. Staff recommends applying the same groundwater monitoring protocols to the Relocation area as have previously been in force for the Schweitzer area.

4.4.2 Municipal Wells in Proximity to Facility

The land application areas are not within the buffer distance of 500 feet to private water sources. No municipal wells appear to be within 1000 feet of the land application areas. The facility meets the suggested buffer zones in the *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater* (Guidance) for both Class D and Class E (un-disinfected) wastewater application. Similarly to the Outback site, the facility proposes to not disinfect applied wastewater during summer application at the Relocation area, although provisions are included in the plans should disinfection be necessary in the future. Due to the isolated nature of the site, staff agrees yet suggests that disinfection be considered when the nearby Schweitzer site is developed for residential use. Appropriate signage shall be required.

4.5 Soils

Soil at the Relocation site is classified as Priestlake gravely sandy loam, which is the same as the soil at the current Schweitzer application site. Due to the similarities in

characteristics between the two sites, staff proposes not to add soil monitoring criteria for the new Relocation site.

4.6 Surface Water

Surface water monitoring is required by the current permit to be performed on Schweitzer Creek at points 300 feet upstream and downstream of the land application area. The facility proposes (MUC, 2007) to sample the unnamed tributary that passes through the Relocation area. Since the Schweitzer application area will be active until Phase IB of the relocation is complete, staff recommends continuing monitoring of Schweitzer Creek until the Relocation acreage is active and the current site is abandoned. As the new acreage is developed, staff also recommends sampling the tributary when possible in order to show any impacts to the local environment as application begins.

4.7 Monitoring Requirements

Due to the eventual abandonment of the spray application acreage at the Schweitzer site and to minimize later confusion, staff recommends that no distinction be made between the spray and subsnow application systems in the monitoring requirements of Section G of the attached draft permit. As discussed in Section 4.5.1, staff suggests that the monitoring protocols be applied to both the Schweitzer and Relocation areas for the upcoming permit cycle.

The current permit requires monitoring of ground and surface water for nitrate, chloride, electrical conductivity, as well as total and fecal coliform bacteria. Due to the extreme variability in the values included in the application materials for chloride and electrical conductivity over the current permit cycle, staff recommends discontinuing monitoring for these parameters. The facility should continue to monitor for coliform bacteria since most of the facility acreage is irrigated with un-disinfected wastewater.

4.8 Proposed Compliance Activities

4.8.1 Updated Plan of Operation

It is understood that a plan of operation, also referred to as an Operations and Maintenance (O&M) Manual, is a living document and is modified as operations and regulatory requirements change. The Guidance recommends that the Plan of Operation contain several Site Management Plans, including a Nuisance Odor Management Plan, Waste Solids Management Plan, and Runoff Management Plan. An Odor Management condition is included in Section F of the attached draft permit in order that the facility has a procedure in place to investigate and mitigate any odor complaints received from the general public. Section E, condition CA-090-01, as it appears in the attached draft permit, requires that the facility submit for DEQ review and approval a plan of operation and specifically calls attention to the Runoff Management Plan for control of possible site runoff, and the Quality Assurance Project Plan (QAPP) for monitoring activities specified

in the permit. For the full text of the condition, see Section E of the attached draft permit. For the complete Plan of Operation Checklist, see Section 1.9.3 of the Guidance.

4.8.2 Seepage Testing of Lagoons

Subsection 493.02 of the current Wastewater Rules (IDAPA 58.01.16) requires all existing lagoons to be seepage tested by April 15, 2012. The Old Lagoon and Lagoon #2 at the Schweitzer Creek site will likely be abandoned before this date. Therefore, no seepage testing is proposed for either of the existing lagoons. Section 4.2 discusses the results of past underdrain sampling for Lagoon #2 and discusses proposed sampling for the next permit cycle.

All new lagoons are also required by subsection 453.02 to be seepage tested as part of the construction process and once every five (5) years after the initial testing. The procedure for testing must be approved by DEQ and the test results submitted to DEQ. Section E, compliance activity CA-090-02, as it appears in the attached draft permit, requires that the facility submit a seepage testing plan for the new lagoons within eight (8) months of permit issuance and also reiterates the seepage limits of the test. For the full text of the condition, see Section E of the attached draft permit.

4.8.3 Site Closure/Rehabilitation Plan

The facility intends to abandon wastewater reuse operations at the Schweitzer Creek site upon completion of construction at the Relocation site. Subsection 493.10 of the Wastewater Rules as well as Standard Condition 10 of Section J in the proposed draft permit require that a site closure plan be developed and submitted to DEQ for approval prior to abandonment of the site. Compliance activity CA-090-03, as it appears in the attached draft permit, specifies that the report include an assessment of monitoring data and remediation requirements prior to site closure. For the full text of the condition, see Section E of the attached draft permit.

4.8.4 Inflow and Infiltration Report

The facility has identified areas of the collection system that experience excessive inflow and infiltration. Compliance activity CA-090-04, as it appears in the attached draft permit, requires that the facility continue to submit with each Annual Report an Inflow and Infiltration Report describing the work done to reduce the inflow and infiltration to the collection system. For the full text of the condition, see Section E of the attached draft permit.

4.8.5 Equivalent Residential Unit (ERU) Report

Compliance activity CA-090-05, as it appears in the attached draft permit, requires that the facility continue to submit with each Annual Report an Equivalent Residential Unit

(ERU) Report. For the full text of the condition, see Section E of the attached draft permit.

4.8.6 Updated Silvicultural Plan

Compliance activity CA-090-06 requires the facility to update the Silvicultural Plans for both the Outback and Schweitzer Creek sites and to include the Relocation site. For the full text of the condition, see Section E of the attached draft permit.

5.0 Conclusion

The following recommendations fall into two major areas. They include loading rate related and other recommendations.

5.1 Loading Rate Related Recommendations

1) It is recommended that the nitrogen loading limit be continued at 150 lbs/acre, as discussed in Section 4.4.2.2.

5.2 Monitoring-Related Recommendations

1) It is recommended that the monitoring frequency for the Lagoon #2 underdrain be increased for the first year to monthly for the period of March through October and every other month, as accessible, for the other four months of the year.

2) It is recommended that monitoring currently required at the Schweitzer site be continued in the new permit until abandonment. It is also proposed that the monitoring protocols currently in effect for groundwater, surface water and wastewater sampling at the Schweitzer site be applied to the Relocation site as new HMUs are developed, as discussed in Sections 4.5.1 and 4.8.

3) It is recommended that the seasonal tributary be monitored at the same frequency as Schweitzer Creek, when possible, as discussed in Section 4.7.

4) It is recommended that ground and surface water monitoring for chloride be discontinued, as discussed in Section 4.8.

5) It is recommended that monitoring for phosphorus be discontinued, as discussed in Section 4.4.2.3.

5.3 Other Recommendations

1) It is recommended that the facility perform seepage testing on the new wastewater storage lagoons as discussed in Section 4.3. See Section E of the draft permit for the Compliance Activity.

2) It is recommended that no distinction be made between spray and subsnow application systems, as discussed in Section 4.7.

6.0 References Cited

Allen, Richard G. and Clarence W. Robison, 2006 (Revised 2007). ***Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho***, Research Technical Completion Report, Kimberly Research and Extension Center, University of Idaho, Moscow, ID

Department of Environmental Quality, *Guidance for Reclamation and Reuse of Municipal and Industrial Wastewater*. December 2006 (referred to as the Guidance).

Kimball, 2003. Kimball Engineering. February 5, 2003. [2002] Schweitzer Wastewater Land Application Site Performance Annual Report WLAP #LA-000090-02.

TOEC, 2004. Toothman-Orton Engineering Company. January 28, 2004. Schweitzer Wastewater Land Application System 2003 Annual Report – WLAP #LA-000090-02.

TOEC, 2005. Toothman-Orton Engineering Company. January 31, 2005. Annual Site Performance Report 2004 for Mountain Utility Company Schweitzer Mountain Resort Wastewater Land Application System (WLAP #LA-000090-02).

TOEC, 2006. Toothman-Orton Engineering Company. January 26, 2006. Annual Site Performance Report 2005 for Mountain Utility Company Schweitzer Mountain Resort Wastewater Land Application System (WLAP #LA-000090-02).

TOEC, 2007a. Toothman-Orton Engineering Company. February 20, 2007. Annual Site Performance Report 2006 for Mountain Utility Company Schweitzer Mountain Resort Wastewater Land Application System (WLAP #LA-000090-02).

TOEC, 2007b. Toothman-Orton Engineering Company. February 26, 2007. Technical Report for Wastewater Reuse Permit No. LA-000090-02 Renewal and Modification.

TOEC, 2008. Toothman-Orton Engineering Company. February 14, 2008. Annual Site Performance Report 2007 for Mountain Utility Company Schweitzer Mountain Resort Wastewater Land Application System (WLAP #LA-000090-02).

cc: WLAP Source File no. LA-000105-03 (SO & CRO)
John Tindall, CRO
Mike Spomer, SO
Richard Huddleston, SO

7.0 Appendices

7.1 Memorandum dated May 31, 2002

May 31, 2002

M E M O R A N D U M

TO: Roger Tinkey, Coeur d'Alene Regional Office
Richard Huddleston, State Water Quality Office, Boise

FROM: Gary Gaffney

SUBJECT: Final Staff Analysis of the Schweitzer Wastewater Land Application Permit LA-000090-02 issued to Resort Water Company

PURPOSE:

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.700 for issuing wastewater-land application permits.

On April 31, 2002 a draft permit was sent by certified mail to the permittee and on May 30, 2002 staff met with the permittee and engineer to receive draft permit comments. The draft permit was revised to reflect comments from the permittee. No other comments on the draft permit were received during the 30-day public comment period.

PROCESS DESCRIPTION:

Population: Resort Water Company (RWC) operates a public drinking water system and a municipal wastewater treatment facility serving the Schweitzer Mountain Resort near Sandpoint Idaho in Bonner County. The wastewater system currently serves 680 equivalent residential users (ERUs) which involves all of the Schweitzer Mountain Resort development. Of the 680 existing ERUs, RWC has a public drinking water system serving about 325 ERUs and the Schweitzer Basin Water Company has a public water system serving the remaining 355 ERUs on the mountain. The RWC and Schweitzer Basin Water Company systems are independent except an interconnection of their water distribution systems for emergency purposes. Both drinking water systems are primarily supplied by ground water wells. All of the drinking water sources are located well above the elevation of the wastewater land application operations.

Master Plan: A Five-Year Wastewater Plan prepared by Kimball Engineering was accepted by DEQ on 2/29/00. It established system improvements needed in 50 ERU increments until the year 2004 or until the system served 900 ERUs. The improvements listed in the Five-Year Plan will be referenced in the permit as compliance items. (See the table on the next page.)

The 1999 permit application projected the need to have 38 acres of subsnow, 36 acres of spray irrigation, and 11.1 MG of lagoon capacity to accommodate the design wastewater flow of 33.80 MGA for 900 ERUs. Presently the system has 34.42 acres of subsnow and 28 acres of spray irrigation. This acreage will accommodate a design flow up to 37.45 million gallons per year (MGA) which is sufficient to serve the current flows, which are in the 20 to 25 MGA range. Additional subsnow and spray irrigation areas are available and will be developed in the future as needed to accommodate the wastewater volume requiring land treatment. The sites for the additional land application activities have already been approved.

The Five-Year Wastewater Plan proposed the following schedule for design flows, capacities and improvements:

ERU	Design Capacity* (MGA)	Spray Irrigation** Acres/MGA	Subsnow*** Acres/MGA	System Improvements****
680	29.78	29.0 / 17.41	33.2 / 20.66	I/I work
730	31.97	29.0 / 17.41	39.0 / 24.27	I/I work Add 6 acres subsnow
780	34.16	29.0 / 17.41	44.9 / 27.89	I/I work Add 6 acres subsnow
830	36.35	29.0 / 17.41	44.9 / 27.89	I/I work
880	38.54	29.0 / 17.41	44.9 / 27.89	I/I work Add 5MG Lagoon Expansion Replace interceptor
900	39.42	29.0 / 17.41	44.9 / 27.89	I/I work New Master Plan

* Design Flow based on 120 gpd/EHU. Although lower than typical residential flows, this design flow has been confirmed by past flow data and reflects the seasonal and recreational nature of the ski resort. Sewell and Associates may be re-evaluating this design parameter in 2002 to reflect reductions in I/I and year 2000-2 flow data.

** Based on maximum of 600,000 gallons/year/acre for 121 days

*** Based on maximum of 22.9 inches/acre/year (about 600,000 gallons per acre per year) for 122 days.

****The system improvement schedule may be modified based on a new Wastewater Master Plan being prepared by Sewell and Associates in 2002.

Ownership: In late 1999, the Schweitzer Mountain development was purchased by Harbor Properties Inc. The new owners formed the Resort Water Company as the entity to own, maintain, and operate the Schweitzer wastewater system and drinking water system. The Schweitzer water and sewer systems were formerly the responsibility of Recreations Utility Company. We understand that the purchase involved transfer of

ownership of the water and sewer systems including all of the property involved with these utilities. The WLAP will be issued to Resort Water Company, as a company solely owned by Harbor Properties.

Outback: This permit will be expanded to include wastewater land application practices being contemplated for the Outback which is a separate restaurant facility located on the north part of the ski resort. The Outback has an existing public drinking water system (transient non-community system supplied by a ground water well) and a subsurface sewage disposal system permitted by the Panhandle Health District. Prior to the five year expiration of this permit, Resort Water Company has proposed to upgrade the Outback building which will require improvements to the drinking water and sewage systems. The sewage system will be reconstructed to include 4000 gallon per day STEP system with subsnow land application used during the winter months as elsewhere at Schweitzer. A 50,000 gallon sewage storage tank has been proposed to store wastewater should conditions prohibit land application.

During the summer months the design engineer has proposed using the same distribution system as the winter subsnow system to provide wastewater treatment for limited summer business at the Outback. DEQ has agreed to this growing season application of septic tank effluent without disinfection on an experimental basis pending evidence from the design engineer after the first operating year of the success of the proposal. Success of the subsnow pilot project at the Outback will be based on acceptable impacts to ground water in downgradient monitoring wells and the ability of the site to accommodate the application rates without surfacing or runoff.

SUMMARY OF EVENTS

1994 WLAP: Recreations Utility Company received their first wastewater land application permit for Schweitzer in 1994. It is identified as LA-000090-01 and was issued on 3/18/94 to allow 5.54-MG by spray irrigation on 16-acres between May 1 and October 15 and 1.8-MG by subsnow application on a 3-acre site between December 1 and April 15. A 230 organisms/100ml. bacteria standard was imposed for the spray irrigation. The subsnow wastewater was not disinfected because it occurs under deep snow coverage where public access is not possible.

When satisfactory performance information was evident, this permit was administratively modified by DEQ in 1996 to allow expansion of the spray and subsnow application areas to accommodate additional wastewater volumes. An experiment with snowmaking as a method for wastewater treatment was attempted in 1997 but abandoned when the range of temperatures proved to be too high in this location to provide for a consistent and reliable snowmaking facility. Two community drainfield areas were originally used on this system but have been eliminated from use in recent years as the spray irrigation and subsnow land application methods replaced the drainfields.

Monitoring: Ground water monitoring of several shallow downslope wells and surface water monitoring of upstream and downstream locations in Schweitzer Creek were

included in the 1994 permit. Schweitzer Creek drains the watershed in which the treatment facility is located and is downhill from the land application areas. Monthly reports and Quarterly summaries were required by the 1994 permit from the engineering consultant and generally indicated compliance with permit requirements. In 1999, DEQ allowed, in an effort to save operating costs, the system operator to assume responsibility from the consulting engineer for all monitoring and reporting duties.

Application: LA-000090-01 expired on March 1, 1999. An application for a new permit was submitted by Kimball Engineering on January 29, 1999. Because of staff limitations, DEQ took no action on the permit application until now. RWC has continued to operate the facility in accordance with the expired permit and has been providing all monthly and annual monitoring reports as required.

The system has not experienced any compliance violations during the three years since the application was submitted and the old permit expired. Proposals to expand the subsnow and land application areas to handle new flows have been approved since the permit expired in 1999. The new permit will include all of the areas projected as necessary to serve the next five years of development at Schweitzer. No specific application for the Outback permit was received although it was discussed in correspondence with the design engineer.

Subsnow Summer/Winter Application Pilot: On March 27, 2002, the engineer submitted a proposal to continue for the 2002/2003 irrigation season a pilot project begin in 2001 to utilize a subsnow distribution system during both the growing season and the subsnow period. In 2001, RWC experimented in the same 1.47 acre area (Areas A and B of Spray Irrigation Area 5) during September and October when 261,000 gallons of wastewater was applied using a subsnow type distribution system. Since unacceptable ground water impacts from this experiment were not detected in monitoring wells, RWC has proposed to continue the experiment. This would involve summer application of 22.9 inches May through October followed by subsnow application during the winter from December through March when sufficient snow coverage is present and at a 40,000 gallons/acre/week rate. The limiting factor to the winter subsnow application will be determined by calculating total nitrogen loadings and stopping the application when annual loadings approach 150 pounds/acre.

DEQ has determined that this proposal is reasonable and will include provisions for the pilot project in the new WLAP. This pilot will give the design engineer good information on the capacity of the land application site to accommodate both summer and winter loadings. If successful, the pilot may be expanded to include the entire system. This will benefit RWC by eliminating the labor intensive spray irrigation piping system and enable the system to operate with permanent distribution networks during summer and winter application periods.

DESCRIPTION OF WASTEWATER TREATMENT AND LAND APPLICATION SYSTEM

Collection: The wastewater system consists of collection of raw sewage (from the older users) and septic tank effluent (from the newer users) with gravity flow down the valley to the treatment lagoons. In the past, the collection system has been subject to excessive inflow and infiltration (I/I) due to the nature of the development (high surface runoff caused by significant rain events and snowmelt periods) and the quality of the collection system construction (lack of inspection and unqualified sewer contractors on some projects).

Evidence that the system has excessive I/I is present. High system flows during 1999/2000 of 29.7 MG can be attributed to a significantly high snowfall amount contributing to I/I. By contrast, in the 2000/1 season, the snowfall was below average and annual flow was 17.9 MG. In August 1999, Kimball Engineering prepared an Infiltration/Inflow Study that recommended a four-year plan to test, rehabilitate, repair, and replace sources of excessive I/I. The recommendations of this study will be continued and included in the permit as compliance items.

A 12-inch diameter interceptor sewer main conveys all of the wastewater from the developed areas to the treatment site, which is located in a remote area several thousand feet from and well below the nearest residential unit or skiing area.

Treatment: The treatment system begins with a flow monitoring station used to measure all wastewater entering the lagoons. Two facultative lagoons are used for treatment.

The old lagoon #1 is a 1.3-MG capacity lagoon installed as part of the original 1971 sewer system construction. It was installed with a liner which has deteriorated significantly during the last 30 years. However, the old lagoon was able to pass seepage tests in 1995 perhaps due to biological sealing of the pond by the sludge blanket. The old lagoon and nearby pump building may be taken out of service and replaced with a larger lagoon and pump station when the sewer system is in need of additional wastewater storage volume. The Five-Year Plan estimated 5-MG of additional lagoon capacity at 888 ERUs which is 200 ERUs past the existing 680 ERU population.

The new lagoon #2 was originally built in 1990 using native material as the seal and had a 3.5-MG capacity. In 1996 the need to provide additional wastewater storage was accommodated by expanding the capacity of the new lagoon to 11.7-MG. The lagoon was then equipped in 1997 with a 60-mil HDPE liner. QA/QC certification of proper liner installation was substituted for seepage test of the new lagoon. An underdrain was installed under the liner with a discharge to daylight on the lower side of the embankment. Checking the underdrain pipe for flow and sampling it for the presence of wastewater (nitrates and fecal coliform bacteria in June and October) will be included in the new permit in lieu of conducting a seepage test of the new lagoon.

Land Application: A pump building is located adjacent to the old lagoon and contains the hypochlorination system, flow meters, irrigation pumps and system controls. From the pump building the wastewater is either sent to spray irrigation during the summer or to the subsnow areas during the winter. The wastewater is disinfected with chlorine prior to spray irrigation but not prior to subsnow application. The wastewater can be either spray irrigation on 28 acres of forested areas during the summer (May 1st through October 31st) or distributed onto 34.42 acres of ground surface for the subsnow system during the winter (December 1st through March 31st). Subsnow consists of a distribution system network of 2-inch piping with ¼-inch holes at regular spacings. Holes are typically 3-6 feet apart. Encasing the pressure distribution lines is 4-inch slotted drain ABS pipe. The slotted drain pipe acts to evenly distribute the wastewater along the length of the lateral line. Problems with ponding and overloading the same area were corrected with use of the drain line.

There are periods of time during May and June when land application is impractical because snowmelt has resulted in saturation of the soils in the sloping sites used for subsnow and spray irrigation. During this spring period, the system has to store all wastewater coming into the lagoons. This volume is commonly in the 7-MG range. By the end of March, the operator needs to have used the subsnow application systems to draw down the volume of stored wastewater in the 11.7-MG lagoon enough to accommodate the 7-MG spring runoff during the next two months. Any excessive I/I becomes critical at this time of year.

In the late fall, the lagoons need to store all wastewater coming into the system from the end of the spray irrigation period on October 31st until the snow accumulation depth is typically several feet and sufficient to allow use of the subsnow system. Based on the year, the subsnow system can start as soon as December 1st but has been delayed in some years until mid January. Since fall wastewater flows are low and the lagoons are typically emptied during the late summer, storage capacity of the November and December flows is readily available. In 2001/2 the total November and December flow was 3.8 MG.

By June or July depending on the year, the large volume of spring snowmelt has runoff and infiltrated to move laterally off the sloping land application sites. The surface soils have then dried and spray irrigation can proceed once the operator determines the area is ready to receive irrigation. Spray irrigation will continue until October when snow or rain or an empty lagoon stops the practice.

Outback: The sewer system improvements to the Outback were approved for construction purposes by DEQ on September 18, 2001 and consist of upgrading the current septic system with construction of a 4,000 gallon per day septic tank effluent system. Effluent will be collected through grease traps and septic tanks from the restaurant and then pumped from the Outback's 50,000 gallon wastewater storage tank to two land application areas called Out I and OUT II each originally 1.17 acre in size and expandable to 2.0 acres each.

The wastewater will be applied to the surface using the same subsnow distribution system as used elsewhere at Schweitzer. The application rate may be less than 360,000 gallons per acres per year although the permit will allow up to 600,000 gallons per acre per year if needed. Summer use of the subsnow application area will be tried on a pilot basis to evaluate operating and performance. Monitoring wells will consist of ten (10) downgradient shallow monitoring piezometers sampled at the same frequency and for the same water quality parameters as are used on the other treatment site.

SITE CHARACTERISTICS

Most of the Schweitzer land application site is 25 to 45% sloped and forested ground with a shallow soil mantle overlying bedrock. The soils in the land application area are classified by SCS as "Priestlake gravelly sandy loam" which is a deep well-drained soil on mountainsides formed in glacial till. The present layout of the irrigation and subsnow areas has the subsnow located at a lower elevation than the irrigation areas. In order to take advantage of earlier snow accumulation at higher elevations and earlier snowmelt and drainage at the lower area, RWC has suggested switching the subsnow areas to the higher elevation and the irrigation to the lower elevation. However, no definite proposal has been provided and the permit will reflect the current locations.

PROJECTED WASTEWATER QUALITY AND LOADING RATES:

WASTEWATER QUALITY:

The lagoon influent is a mixture of raw sewage and septic effluent. After retention in the lagoons for a variable number of days depending on the time of year, the wastewater is chlorinated and used for irrigation or used for subsnow application without chlorination. Unless ground water monitoring detects unacceptable water quality, the permit will not include any provisions to routinely monitor for typical wastewater treatment parameters except for total coliform bacteria and nitrogen. Total nitrogen loadings from 1995-7 monitoring indicated that 35 to 45 lbs.N/acre were applied to the forests. This is well below the design maximum nitrogen load of 100 to 150 lbs./acre recommended.

Land Application Subsnow and Spray Irrigation Management Areas

Subsnow Number	Subsnow Area (Acres)	Max. Subsnow Capacity (MGA)		Spray Number	Spray Area (Acres)	Max. Spray Capacity (MGA)
S-1	1.00	0.60		1A	0.70	0.42
S-2A	1.00	0.60		1B	1.80	1.08
S-2B	1.00	0.60		2	3.00	1.80
S-3	2.21	1.33		3	2.50	1.50
S-4	2.31	1.39		4	3.00	1.80
S-5	1.18	0.708		5	2.50	1.50
S-6	1.13	0.678		6	2.50	1.50

Subsnow Number	Subsnow Area (Acres)	Max. Subsnow Capacity (MGA)		Spray Number	Spray Area (Acres)	Max. Spray Capacity (MGA)
S-7/8	0.74	0.444		7	3.00	1.80
S-9	3.50	2.100		8	3.00	1.80
S-10	8.45	5.070		9	3.00	1.80
S-11	3.87	2.322		10	3.00	1.80
S-12*	3.12	1.872		Subtotal	28.0	16.80
S-13*	2.48	1.488		11**	3.00	1.80
S-14*	2.43	1.458		12**	2.50	1.50
Subtotal	34.42	20.65		13**	2.50	1.50
S-15	3.67	2.20				
Total	38.09	22.85		Total	36.0	21.6

*Subsnow areas S-12, S-13, and S-14 for 8.03 acres and 4.82 MGA were not in use 1999/2000 but are currently in use.

** Spray areas 11, 12, and 13 comprising 8 acres total are not in use but are planned for future development when the need to irrigation additional wastewater arises.

WASTEWATER QUANTITY:

Annual Reported Wastewater Influent Volumes at Schweitzer

Year Nov 1 to Oct 31	Actual ERUs	Influent MGA	Effluent MGA	Irrigation MGA	Drainfield MGA	Subsnow MGA
2000/1	680	17.922	20.921	8.2116	0	12.71
1999/2000	653.5	29.715	23.6378	10.3623	0	13.2755
1998/9	623	22.709	26.144	15.988	2.204	7.952
1997/8	607	20.947	20.906	13.112	3.776	4.017
1996/7	591	22.308	25.050	16.436	4.136	4.479
1995/6	550	19.333	21.674	8.95	5.71	4.47
1994/5	521	19.408	22.551	6.96	5.54	1.80
1993/4	485	15.86	12.8	0.7236	11.5914	0.4853
1992/3	469	16.923	14.44	0	14.44	0
1991/2	458	12.100	12.000	0	12.0	0
1990/1	438	16.600	16.6	0	16.6	0
1989/90	400	No Record	No Record	0	All	0
1988/9	385	14.300	14.3	0	14.3	0
1987/8	370	14.200	14.2	0	14.2	0
1986/7	370	15.400	15.4	0	15.4	0

Based on the Five-Year Wastewater Plan for Schweitzer dated November 1999, growth at Schweitzer will be accommodated in 50 ERU increments starting at 680 ERUs and

ending at 900 ERUs. Historical data suggests that the wastewater system receives flow at a rate of 103 gallons per day per ERU. Based on this design flow, 900 ERUs will produce 33.8-MG. A water balance in Figure 1 of the permit application distributes the 33.8-MG by month and by irrigation or subsnow sites. A total of 36 acres of spray irrigation will be loaded at less than 22.93 inches or 22.41-MG per year (622,000 gallons/acre/year). A total of 38 acres of subsnow application will be loaded at less than 14.7-inches per year or 15.2-MG (400,000 gallons/year/acre). These areas are necessary to accommodate the ultimate design flow.

The permit will contain a compliance schedule for implementation of system improvements based on the 1999 Five-Year Wastewater Plan as keyed by the number of ERUs connected to the sewer system. The recommended inflow/infiltration project proposed by Kimball Engineering will also be included in the permit in the compliance schedule section. Annual Reports will require reporting of actual connections and a commitment when the time comes to implement the next phase of improvements.

Monthly Lagoon Influent at Schweitzer from November 1994

Month/Year	2001/2	2000/1	1999/2000	1998/9	1997/8	1996/7	1995/6	1994/5
November	1.2931	1.41464	1.266156	0.858	1.292	0.827	1.416	1.050
December	2.5007	2.77568	2.481645	2.549	2.016	2.402	2.342	2.635
January	3.111	2.67310	3.122950	2.805	2.494	2.314	2.417	2.864
February	2.211	2.06115	3.811633	2.140	2.322	1.437	2.661	3.160
March	2.227	1.92278	3.725600	2.353	2.737	1.800	2.159	2.322
April		1.37400	3.615926	2.016	2.636	1.573	2.049	1.698
May		1.54936	2.892001	2.685	2.945	2.836	2.112	1.485
June		0.80615	1.946428	2.441	1.914	1.880	0.849	0.798
July		0.80140	1.660753	2.022	1.065	2.069	0.916	0.871
August		1.00735	1.724518	1.638	0.847	1.987	1.146	1.152
September		0.76341	1.711831	0.716	0.524	1.655	0.616	0.673
October		0.77250	1.791759	0.485	0.156	1.528	0.650	0.700
Total		17.9215	29.7512	22.709	20.947	22.308	19.333	19.408

HYDRAULIC LOADING RATES

The irrigation season for this project will be from May 1st to October 31st (214 days) and the subsnow season will be from December 1st to March 31st. The spray irrigation area will be limited to less than 22.93 inches per year applied at maximum weekly and monthly rates (rainfall plus wastewater in inches) specified in the permit application and restated in the permit. The subsnow application rate will be less than 600,000 gallons per year per acre during the four months permitted for this activity. For sizing purposes, subsnow has been considered at 400,000 gallons/acre/year. Actual application rates will

be less depending on site conditions, such as rainfall or high ground water, that will limit the actual application periods.

CONSTITUENT LOADING RATES

The nitrogen loading rate as established previously will be 150 lbs./acre/year based on forest crop needs. The actual nitrogen loadings ranged from 35 to 45 lbs./acre/year during the three 1995-7 monitoring cycles. Because there is evidence of minimal nutrient loadings and no evidence of impact to shallow ground water quality during eight year of operation, soil sampling is not included.

GROUND WATER CONSIDERATIONS

The land application sites are located on a sloping forested site above in elevation and over 200 feet from Schweitzer Creek. There is no question that treated wastewater from the land application sites eventually recharges Schweitzer Creek below the site by subsurface movement. However, based on previous stream sampling data, there is no evidence and minimal concern that this practice is impacting surface water quality. A greater risk is posed by the inappropriate application of wastewater to the surface resulting in runoff reaching the creek especially during subsnow applications. By complying with the permit application rates and inspecting the application areas, the operator can assure that no surface runoff reaches the creek.

There are no public facilities, wells, or access within 1000 feet or private drinking water wells within 500 feet downgradient from this remote WLAP site that could be directly impacted or monitored for ground water quality changes due to the Schweitzer land application system. The land application area and many of the management units will have an upgradient and downgradient shallow monitoring well installed and monitored for parameters indicative of wastewater impacts (Water level, Nitrate, chloride, conductivity, and coliform bacteria). Schweitzer Creek is not used as a public drinking water supply by any downstream systems. Schweitzer Creek flows into Sand Creek, which is a tributary to Lake Pend Oreille.

BUFFER ZONES

The irrigation and subsnow sites are adjacent to the treatment lagoons, which is all located in a remote area on private property below the resort with no direct public access. Fencing of the irrigation areas has not been proposed by the permittee or required by DEQ in the previous WLAP because the area is remote with limited public access. Prominent signing of the application areas has been required. No buffer zones except 50 feet to intermittent surface water drainageway and to Schweitzer Creek have been imposed previously. A disinfection standard of 230 total coliform bacteria was contained in the previous permit for spray irrigation and will be continued because it meets current guidance and is adequate. No subsnow disinfection standard was assigned previously

because the wastewater was applied under deep snow cover with no public access. The same standards will be applied to the subsnow section for the new permit.

Table 3, Disinfection and Buffer Zone Requirements

Disinfection level Total coliform (No. of coliform bacteria/100ml)	Distance to Public Access (feet)	Distance to inhabited Dwellings (feet)	Distance to streams (feet)	Distance to private/public water wells (feet)
230 ¹	300	1000	50	500/1000

1. The median number of total coliform shall not exceed 230/100 ml, as determined from the bacteriological results of the last five days for which analyses were completed. The maximum total coliform number shall not exceed 2400/100ml.

SITE SPECIFIC CONDITIONS

- Compliance with the Five-Year Wastewater Plan for system improvements tied to the number of ERUs.
- Continuation with recommendations in the August 1999 Inflow and Infiltration Study.
- Contingency approval of the Outback subsnow summer and winter application proposal pending evidence of success reported by the design engineer following operation of the pilot system.
- Contingency approval of the Area A & B subsnow summer and winter application proposal pending evidence of success reported by the design engineer following operation of the pilot system.
- Revised and new silvicultural plans for the 75 acres of forested application areas.
- Preparation of another five-year master plan in year 2006.

RECOMMENDATIONS:

DEQ staff recommends elimination of the monthly and quarterly reports if the Annual Reports prove to be comprehensive and complete.

The permittee has provided comments on the draft permit and these comments have been incorporated into the final permit. Signature of the final permit by the Regional Administrator and issuance of the final permit is recommended.

7.2 Memorandum dated March 28, 1996

March 28, 1996

MEMORANDUM

TO: Dick Rogers, Water Section Manager
Construction Permits Bureau

FROM: Jim MacInnis, Water Quality Engineer
Construction Permits Bureau, NIRO

SUBJECT: Staff Analysis of a Request for Permit Modifications (M-0090-01 and M-0090-02) Schweitzer Land Application Permit (LA-000090-02)

Two permit modifications to the Schweitzer Wastewater Land Application Permit LA-000090-02, one received May 22, 1995, and the other received February 7, 1996, have been reviewed, and the staff analysis of these two modifications is presented in this memo. Since the second modification request supersedes the first, only the second modification will be analyzed.

Permit Modification Request

The February 3, 1996, letter from Recreations Utility Company, Inc. (RUC), received February 7, 1996, contains two modification requests:

First, RUC requests an increase in the application rate to one inch per week. Increasing the application rate to one inch per week on the existing 16-acre land application site would almost double the current application rate of 5.54 million gallons (MG) to 9.60 MG. The nitrogen loading at the higher rate is estimated at 100 pounds per acre.

Second, RUC requests increasing the land application area by 12 acres to include an area designated in their WLAP application as "future land application area." The proposed 12-acre addition to the site is north of the existing land application area, and it has similar slope, soil and vegetation characteristics as the existing area. RUC also requests a one inch per week application rate on the 12-acre site.

Staff Analysis

Application Rate Increase: The permitted application rate is 5.56 MG on 16 acres, equivalent to 12.8 inches annually. The proposed application rate, one inch per week for twenty-four weeks, would almost double that rate to 24 inches annually, or 10.4 MG. The request for a uniform one inch per week application rate conflicts with the information contained in the draft Plan of Operation (POO) for this facility, dated November 1995. Table 2 in the POO provides estimated values for consumptive crop use

and maximum supplemental water use by the forest crop. A summary of information in that table is presented in Table 90-A. This table indicates that two and a half months of the irrigation season (May, September, and October) have an estimated irrigation volume for plant consumptive use that is less than one inch per week. The other three months have maximum irrigation rates greater than one inch per week.

Table 90-A Summary of Plan of Operations, Table 2		
Month	Maximum Monthly Irrigation	Maximum Weekly Irrigation
May	1.78 inches	0.45 inches
June	5.51 inches	1.38 inches
July	9.03 inches	2.26 inches
August	6.77 inches	1.69 inches
September	3.02 inches	0.76 inches
October (half month)	0.19 inches	0.05 inches
Total Maximum Annual	26.30 inches	

In the 1995 irrigation season, RUC requested application of an additional volume of wastewater because the permitted wastewater volume had been applied to the site by August (see Martin Bauer's September 1, 1995, letter to RUC). Accordingly, the site has proven capable of hydraulically accepting and treating a higher volume of wastewater than the 5.56 MG permitted in the WLAP. However, DEQ staff believes that a uniform one inch per week application rate would be too high for the early and late season months.

Although the proposed one inch per week application rate is less than the 1.5 inches per week guideline rate, the high slope on the land site necessitates a lower rate to prevent runoff. Staff suggests the application rate in the permit be modified, according to the information in Table 90-B. If staff recommendations for weekly maximum application rates in the permit are accepted, then a weekly application rate category should be added to the monitoring requirements in Schedule B of the permit.

Expand Land Application Site: DEQ staff supports the expansion of the land application site by 12 acres as proposed by RUC. The proposed area was designated an expansion site in the permit renewal application documents in 1992. To incorporate the proposed site into the land application area, DEQ staff has identified the following associated work tasks: a) amend the monitoring plan; b) prepare a sprinkler layout plan; and c) evaluate the need for additional warning signs.

Recommendation

Staff recommends modifying the LA-000090-02 permit as follows:

- 1) Increase the application volume on the existing 16-acre land application site from 5.54 million gallons per year to 9.96 million gallons per year, according to the maximum weekly application rates in Table 90-B.

Table 90-B				
Recommended Application Rates and volumes				
Month	Maximum Weekly Irrigation	Recommended Weekly Irrigation	Monthly Irrigation Volume 16-acre	Monthly Irrigation Volume 12-acre
May	0.45 inches	0.50 inches	0.96 MG	0.72 MG
June	1.38 inches	1.25 inches	2.33 MG	1.75 MG
July	2.26 inches	1.25 inches	2.40 MG	1.80 MG
August	1.69 inches	1.25 inches	2.40 MG	1.80 MG
September	0.76 inches	0.75 inches	1.40 MG	1.05 MG
October (15 days)	0.05 inches	0.50 inches	0.47 MG	0.35 MG
Total	26.30 in/year	22.90 in/year	9.96MG	7.47 MG

- 2) Expand the land application site to include the 12-acre area shown in the Appendix A map as "Future Land Application Area." The application volume on the additional 12 acres shall be 7.47 million gallons per year, according to the maximum weekly application rates in Table 90-B.
- 3) Amend the monitoring requirements in Schedule B of the permit to include:
 - a. weekly application rate calculations; and,
 - b. ground water monitoring from new wells on the expanded site.
- 4) Add the following items to the compliance conditions and schedules in Schedule C of the permit:
 - a. Prior to any irrigation on the expanded site submit, for review and approval, a ground water monitoring plan for the expanded site, including at least one up gradient and three down gradient monitoring wells;
 - b. Prior to any irrigation on the expanded site submit, for review and approval, a sprinkler layout plan; and
 - c. Include the expanded site in the signing requirements.
- 5) The Silvicultural Management Plan, currently being reviewed by DEQ, shall be revised to include the expanded 12-acre site.

Roger Tinkey
March 31, 2008
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A letter authorizing the modifications to the permit will be prepared.

JM/rj LA090MOD.SAM

7.3 Memorandum dated March 9, 1994

March 9, 1994

M E M O R A N D U M

TO: Martin Bauer, Bureau Chief
Construction Permits Bureau

FROM: Gary Gaffney, P.E., Senior Water Quality Engineer
Jim MacInnis, P.E., Water Quality Engineer
North Idaho Regional Office

SUBJECT: Staff Analysis of Schweitzer Mountain Resort Land
Application Permit Application (Sandpoint) LA-
000090 (Municipal Wastewater)

Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.17400,04 (Wastewater-Land Application Permit Regulations) for issuing land application permits. It states the principal facts and significant questions considered in preparing the draft permit conditions or intent to deny, with a summary of the basis for the draft conditions or denial with references to applicable requirements and supporting materials.

Process Description

Recreations Utility Company owns and operates the drinking water and wastewater treatment systems that serve about 350 residential users and the ski lodge, hotel, and commercial development (about 100 equivalent connections) at Schweitzer Mountain Resort near Sandpoint.

The wastewater treatment system consists of gravity collection of septic tank effluent and raw sewage with conveyance to two facultative treatment and storage lagoons capable of holding about 5-6 million gallons. A combination of subsurface disposal of 6.94 million gallons per year (MGA) in two existing drainfields, innovative subsnow disposal of 1.8 MGA during the winter, and conventional land application of 5.56 MGA on forested areas has been proposed to treat and

provide final disposal for up to 14.3 million gallons of wastewater produced by the system each year.

The subsnow application system and the sprinkler irrigation system will be covered under one wastewater land application permit issued by DEQ. The subsurface disposal system will continue to operate under a permit administered by the Panhandle Health District.

Summary of Events

The original sewage system was designed by engineering consultants and installed in the 1970s. Raw wastewater was collected and treated in a single lagoon and disposed by subsurface disposal in a large series of trenches terraced above the lagoon site.

In 1986 a DEQ inspection revealed evidence of past failures of the drainfield serving the system. This resulted in a temporary moratorium being imposed by the Panhandle Health District on all new construction until an agreement was negotiated for additional drainfield capacity and upgrading of the sewage system. In 1988 a new 5 acre community drainfield capable of serving existing flows was installed. The next year construction was completed on a new 5 million gallon capacity wastewater lagoon.

Since the Panhandle Health District determined that site conditions will prohibit expansion of the subsurface sewage disposal system at Schweitzer to serve future growth projections, Recreations Utility Company proposed in 1990 three methods of wastewater disposal to meet their need to accommodate new growth.

With the concurrence of the Panhandle Health District, the existing two drainfield facilities would be retained for limited service and eventually be phased out of operation except for emergency situations. Seasonal high ground water in the spring had contributed to wastewater surfacing from these drainfields in the past. In addition, the wastewater application rates for drainfields under the present regulations made a subsurface disposal system too large and expensive to accommodate the peak flows necessary for total wastewater disposal at Schweitzer.

A conventional sprinkler irrigation system would be developed on 80 acres of presently forested lands near the lagoons and within an area planned for a future golf course. The parent company for Recreations Utility, Pack River Corporation has large land holdings available at Schweitzer that could be used to expand the land application system if necessary in the future as the subsurface sewage system is phased out.

The third method proposed for wastewater disposal involved application of wastewater to the ground surface underneath the deep winter snow pack. The idea was that during the winter months the ground water level drops and the soil surface insulated by the thick snow cover is unfrozen and capable of infiltrating wastewater. With DEQ knowledge the engineering consultant tested this theory in 1990 and 1991 in small 1-2 acre areas and found that the concept was a viable option for wastewater disposal.

In August of 1991 a permit application was submitted to DEQ and found incomplete. A revised permit application submitted in July of 1992 was also found incomplete. Information submitted August of 1992 was found to be sufficient for preparation of a draft land application permit.

The permittee has not found it necessary to land apply wastewater since the new drainfield and lagoon were completed but will need to start sprinkler irrigation in 1993. Except for the sprinkler piping everything necessary to irrigate has been installed.

Discussion

The Review Process

Considerable time and effort has been expended by the permittee and DEQ to establish the capacity of the Schweitzer wastewater system. DEQ has agreed to accept a limitation of 14.3 MGA on the present system. The permittee has agreed to construct additional wastewater system capacity if flows exceed the 14.3 MGA level. In 1992 measured flows were 12.1 MGA.

Wastewater Quality and flows

Due to the recreational nature of the development wastewater flows are highest in the winter and lowest in

the summer and fall. The permittee has been providing quarterly wastewater flow reports to DEQ since 1986.

Annual flows have been as follows:

MGA	CALENDAR YEAR
15.4	1987
14.2	1988
14.3	1989
NO RECORD	1990
16.6	1991 (MISCALIBRATION?)
12.1	1992
14.4	1993

The engineer has estimated that up to 50% of the total annual wastewater flow could be attributed to excessive infiltration and inflow (I\I) into the collection system. A program to locate sources of I\I and repair or replace sewer lines has been instituted. In 1992 the permittee replaced several hundred feet of interceptor sewers and several sections of failed collection line in an effort to secure additional system capacity by reducing I\I flows.

Constituent Loading

The application has proposed weekly application on the sprinkler areas of 2 inches for 18 weeks each season with a target nitrogen loading of 100 lbs./acre for the forested site.

For the subsnow area the permittee has proposed application of 1.8 MGA on 3 acres starting January 1 and ending March 31. The subsnow nitrogen application rate will be 150 lbs./acre.

The permit has been written to require quarterly ground water monitoring of ten shallow wells that surround the subsnow and sprinkler sites. If any of these monitoring wells reveal chemical or bacteria contamination, the

permittee will be required to modify the operating procedures and expand the facilities.

Site Characterization

The Schweitzer wastewater treatment site is located in the lower part of the Schweitzer Basin in an area of steep terrain with predominantly deep gravelly sandy loam soils of glacial origin. The soils report for the site submitted with the application has concluded that the soils are well suited for land application of wastewater. Field investigations have revealed that the soil profile does contain a restricting layer that produces a seasonal high ground water during spring runoff periods in April, May, and June. During this time subsurface disposal is not successful and all wastewater must be stored in the existing lagoons until dryer conditions will allow land application.

Other Concerns

DEQ has agreed with the permittee to let them continue to make new sewer connections each year at Schweitzer based on their success from the previous year to reduce overall flow by eliminating I/I flows. As long as the annual flows remain below the 14.3 MGA maximum, DEQ has agreed to recommend to Bonner County that the county continue to issue new building permits at Schweitzer. In 1992 DEQ recommended up to 55 new permits be allowed and only 20 permits were issued. For 1993 DEQ has recommended that up to 166 new permits be allowed based on a 12.1 MGA flow for 1992 contingent on the permittee submitting a plan for I/I reduction construction for 1993.

The success of the subsnow system will be established during the next two or three years. If subsnow proves unsuccessful, the sprinkler irrigation system can be expanded to treat and dispose of the subsnow allocation of the flow. The permittee has indicated future plans to replace the original 1 MG lagoon with a larger lagoon in the future when the need for more storage and treatment capacity arises.

Draft Permit Meeting

At the request of the permittee, the permittee's staff meet with Jim MacInnis and Gary Gaffney on February 4, 1994 at the DEQ Coeur d'Alene field office to discuss the Draft Wastewater Land Application Permit. A full meeting summary may be found in the project files, and the main points of agreement are presented below:

- Based on average fall meteorological data, the fall spray irrigation cessation date will be October 15.
- Based on average November and December snow levels at the site, the sub-snow commencement date will be December 1.
- Upgradient ground water monitoring will be performed annually to establish constituent background levels.
- Ground water monitoring wells will be installed as the corresponding monitoring sites are activated and used.
- Seepage tests must be performed on all lagoons. Previous tests may be accepted if the tests are no older than five years. Lagoon repair and replacement will occur in a timely manner in accordance with a plan approved by DEQ.
- Based on the site location and on previous field visits, fencing the application site is not required, but signs must be placed on the site perimeter.

Recommendation

Staff recommendation is that land application of wastewater be permitted at Schweitzer as proposed in the applications. The permittee has committed to upgrade the wastewater facilities if the I/I reduction efforts prove unsuccessful. Being able to continue to develop new connections should motivate the permittee to maintain the approval status of the wastewater system and to comply with the land application permit.

GG&JM/njk/STAFF-02.090

cc: Dick Rogers
COF 1.1 P&E

WLAP Source File no. LA-000090

7.4 Irrigation Rate Formulation Methodology

No data currently exist for natural forest hydraulic or nutrient loadings. The IWR values for growing season application at MUC (Table 3) were estimated using precipitation deficit (P_{def}) data available for “Orchards – Apples and Cherries no ground cover” and “Range Grasses – long season” from the ET_{Idaho} Sandpoint KSPT station (<http://www.kimberly.uidaho.edu/ETIdaho/stninfo.php?station=108137>). Table 4 shows the data taken from the ET_{Idaho} website for both categories.

Table 4 Precipitation Deficit (P_{def}) Data

	Orchards – no ground cover		Range Grasses	
	mm/day	in/month*	mm/day	in/month*
January	-0.11	-0.134	-0.15	-0.183
February	0.07	0.077	0.03	0.033
March	0.27	0.330	0.10	0.122
April	0.55	0.650	0.37	0.437
May	1.38	1.684	1.20	1.465
June	3.46	4.087	2.27	2.681
July	4.81	5.870	3.14	3.832
August	3.99	4.870	1.93	2.356
September	2.10	2.480	0.37	0.437
October	-0.27	-0.330	-1.04	-1.269
November	-2.83	-3.343	-3.23	-3.815
December	-1.15	-1.404	-1.58	-1.928

* Calculated value (ET_{Idaho} data in mm/day / 25.4 mm/in * #days in month)

Since the facility is land-applying wastewater year-round during both the growing and non-growing seasons, it was determined to tie the growing season application rate to the IWR while the non-growing season limits would be sufficient to ensure adequate storage in the lagoon. For a mixture of 55% Orchard and 45% Range Grasses, Table 5 shows the composited values used for the growing season IWR for MUC. Negative values represent months where little or no growth takes place.

Table 5 Composited P_{def} Values for MUC “Forest”

Month	P_{def}*
January	-0.156
February	0.057
March	0.236
April	0.554
May	1.585
June	3.454
July	4.953
August	3.738
September	1.561
October	-0.752
November	-3.555
December	-1.640

* Expressed in inches per month

Since the facility applies wastewater during the non-growing season by a subsnow drip system, additional volume was allowed for the period of October through April. Table 6 shows the additional volume for the composited “forest” system.

Table 6 MUC “Forest” with Non-Growing Season Irrigation

Month	Calculated Irrigation Rates*
January	2.84
February	2.56
March	1.74
April	1.05
May	1.59
June	3.45
July	4.95
August	3.74
September	1.56
October	1.25
November	0.94
December	1.86

* Expressed in inches per month

For growing season application the spray system is the dominant means of application while the subsnow drip system dominates in the non-growing season. From Table 4-12 of the *Guidance*, the system efficiencies were estimated to be 85% and 90%, respectively. In order to represent the application system effectively, the values in Table 6 were divided by the efficiency of the dominant distribution system for each part of the year and the resulting values are given in Table 3. The irrigation system is discussed in Sections 4.1, 7.1, 7.2 and 7.3.